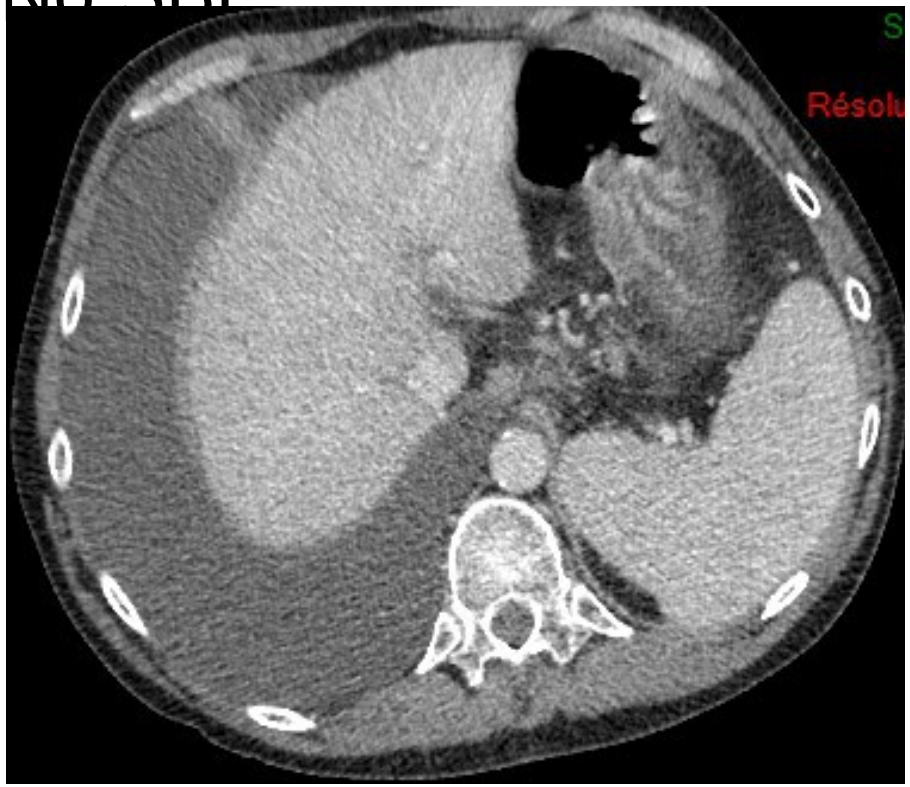
Mr C, 52 year-old

- HCV-related cirrhosis, DAA in 2016, SVR
- No comorbidity, no alcohol consumption, 1.8 m, 92 kg
- January 2017: ascites, diuretics, controlled ascite
- February: overt encephalopathy (Na 125 mM, stop diuretics)
- March 2017: overt encephalopathy (no precipitating event), rifaximin
- April 2017: overt encephalopathy (no precipitating event)

Mr C, 52 year-old

- August 2017
  - Refractory ascites, 10 L/week
  - No SBP



INR	1.2
Bilirubin	34 µM (2 mg/dL)
Creatinine	100 µM (1.1 mg/dL)
Na	128 mM
Albumin	22 g/l
AST	52 UI/L
ALT	85 UI/L
GGT	180UI/L
PAL	90 UI/L
αFP	5 µg/L

How to manage?

Refractory ascites: therapeutic options

Treatment	Advantages	Disavantages
Paracentesis	Easy, effective No contra-indication	Frequently repeated bleeding, leakage, strangulation, PICD Palliative
TIPS	Effective (75%) Improvement of renal function, nutritional status, QOL	Failure, bleeding, encephalopathy Contra-indication: encepalopathy, liver insufficiency (MELD > 18) Palliative
LT	Definitive	Morbidity, mortality

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M C, 52 year-old

- TIPS: no (3 episodes of encephalopathy, rifaximin)

- Evaluation for Liver Transplantation

  - Patients with refractory ascites should be evaluated for LT (**III;1**).

EASL CPG for the management of patients with decompensated cirrhosis. J Hepatol. 2018 Aug;69(2):406-460

Pretransplant evaluation

- Imaging: no HCC, no vascular abnormalities

- Cardiopulmonary evaluation
  - Normal lung CT-scan
  - Echocardiography: preserved ejection function, no systolic pulmonary hypertension

- Kidney evaluation
  - Normal urinary sediment, no proteinuria
  - Normal imaging
  - GFR (Iohexol clearance): 57 ml/min/1.73 m2

M C, listed for LT

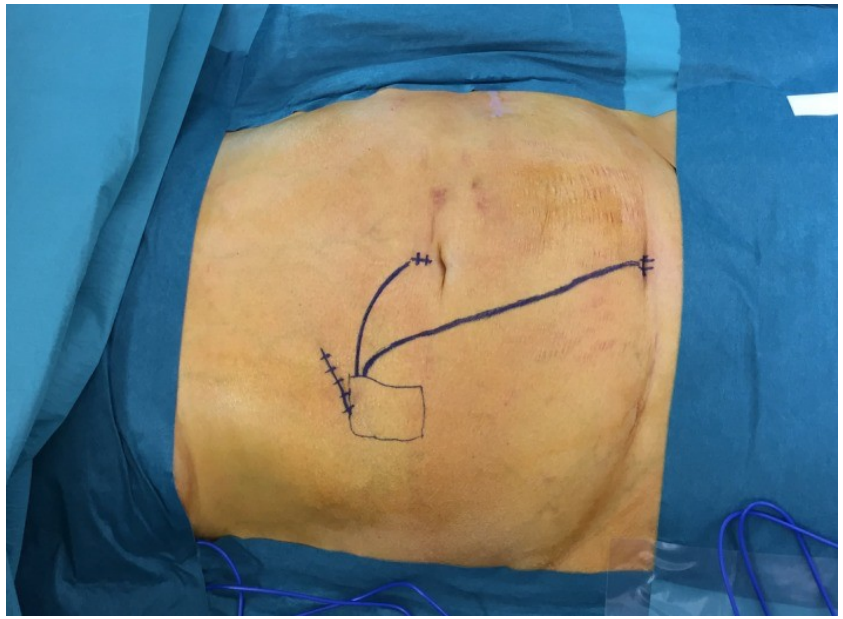
- Blood group B (predicted waiting time over 1 year)
- Paracentesis /week (10 L)
- Any other option?

- Alfapump® implantation in patients with refractory ascites not amenable to TIPS insertion is suggested in experienced centres. However, close patient monitoring is warranted because of the high risk of adverse events including renal dysfunction and technical difficulties (**I;2**).

EASL CPG for the management of patients with decompensated cirrhosis. J Hepatol. 2018 Aug;69(2):406-460

Peritoneovesical pump (Alfapump®)

- A peritoneal catheter draining ascites
- A bladder catheter « pushing »ascites into the bladder
- Pump installed subcutaneously in the abdominal wall
- minimally invasive surgery, general anesthesia
- Mobilization of ascites via micturation
- Battery charged « wireless » 10’ tid

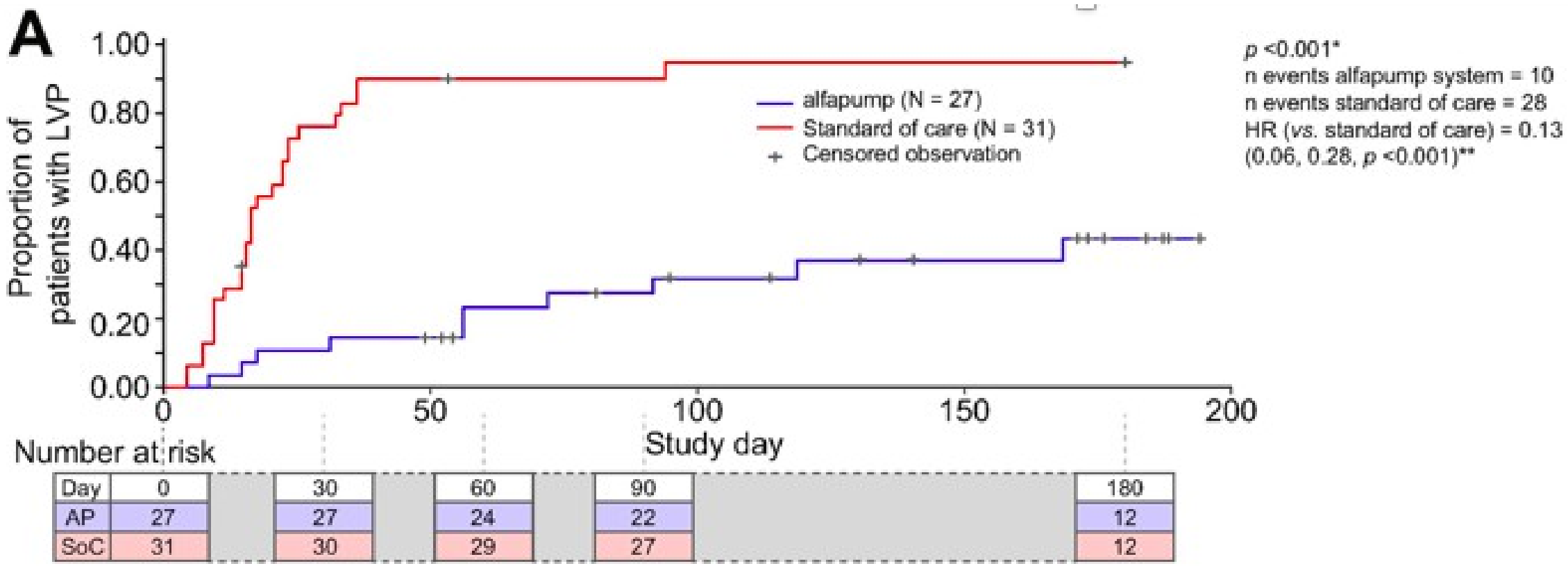


Alfapump vs. Paracentesis (not eligible for TIPS) Randomized Controlled Trial

	Pump (n=27)	Paracentesis (n=31)	p
Age (years)	61	62	ns
MELD	12	11	ns
Child B/C (%)	82/11	77/16	ns
Alcohol (%)	74	68	ns
Albumin (g/L)	34	31	ns
Prior SBP (%)	26	23	ns
Prior renal failure (%)	41	20	ns

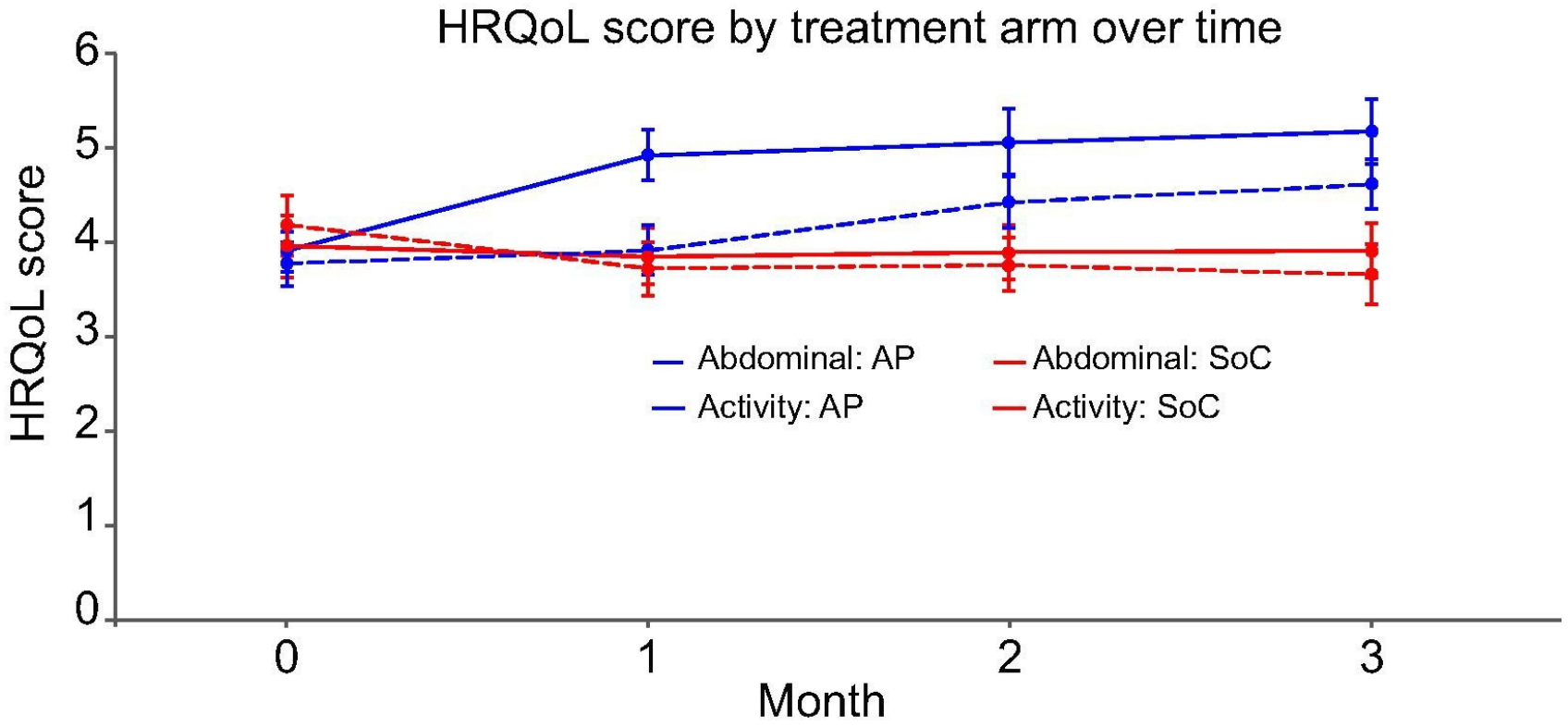
Bureau et al, J Hepatol 2017; 67(5):940–9

Less paracenteses in alfapump group



Bureau et al, J Hepatol 2017; 67(5):940–9

Better quality of life in alfapump group



Number of patients completing survey for abdominal and activity

Month	0	1	2	3
AP	27	26	22	22
SoC	31	29	29	27

Bureau et al, J Hepatol 2017; 67(5):940–9

Other results

- More adverse events in Alfapump group (early AKI, reversible, similar rate of infections)

- trend to improved nutritional status in the AP group compared with SoC ($p = 0.099$ at Day 30 and $p = 0.090$ at Day 90)

Bureau et al, J Hepatol 2017; 67(5):940–9

Real life data

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Aliment Pharmacol Ther. 2017 Nov; 46(10): 981–991.
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PMCID: PMC5698811
PMID: 28940225

Treatment of refractory ascites with an automated low-flow ascites pump in patients with cirrhosis

G. Stirnimann,[✉1] T. Berg,[2] L. Spahr,[3] S. Zeuzem,[4] S. McPherson,[5] F. Lammert,[6] F. Storni,[1] V. Banz,[1] J. Babatz,[7] V. Vargas,[8] A. Geier,[9] A. Stallmach,[10] C. Engelmann,[2] C. Trepte,[11] J. Capel,[11] and A. De Gottardi[1]

N=56
Age: 62 yrs
Alcohol cirrhosis 69%
Hx of renal dysfunction 46%
Hx of SBP: 39%
Hx of UTI: 16%
Child B/C: 64%/26%
SCr: 111 µmol/L

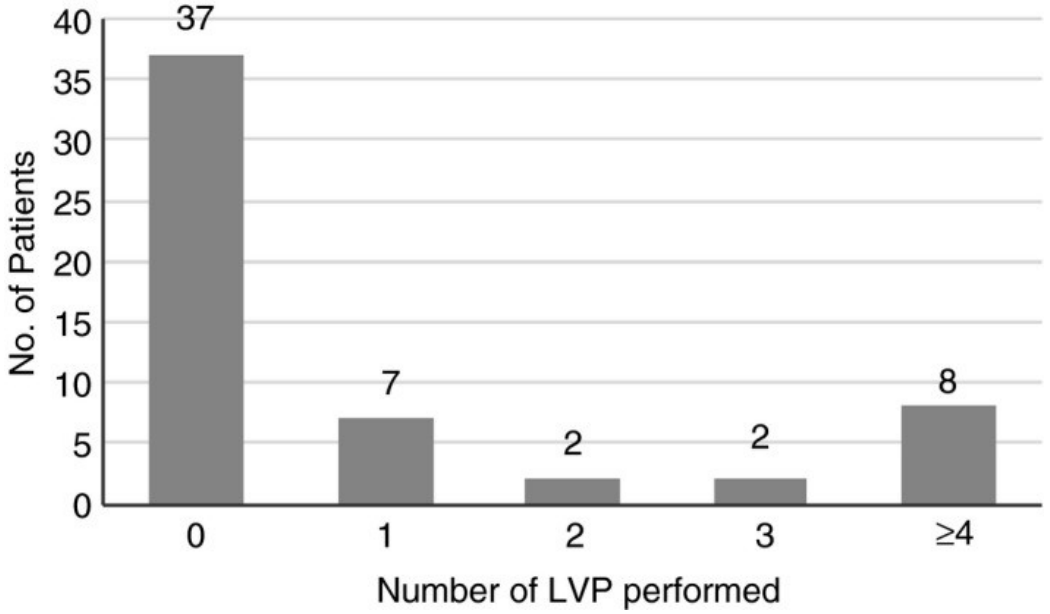
Follow-up 24 months

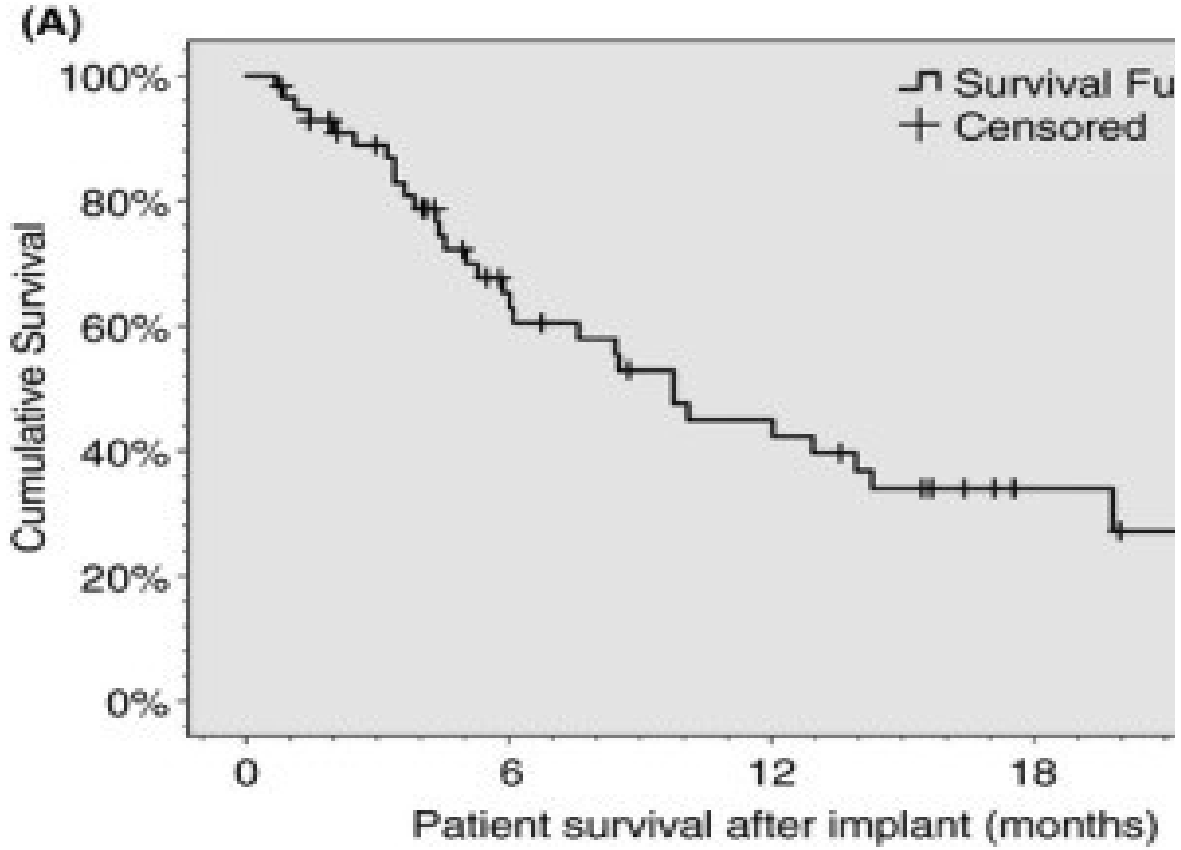
Results

- Volume of ascites drained : 28 L/patient/mo
- Pump explantation: n=27 (technical problems)
- Reintervention: n=13

Stirnimann. Aliment Pharmacol Ther. 2017 Nov;46(10):981-991

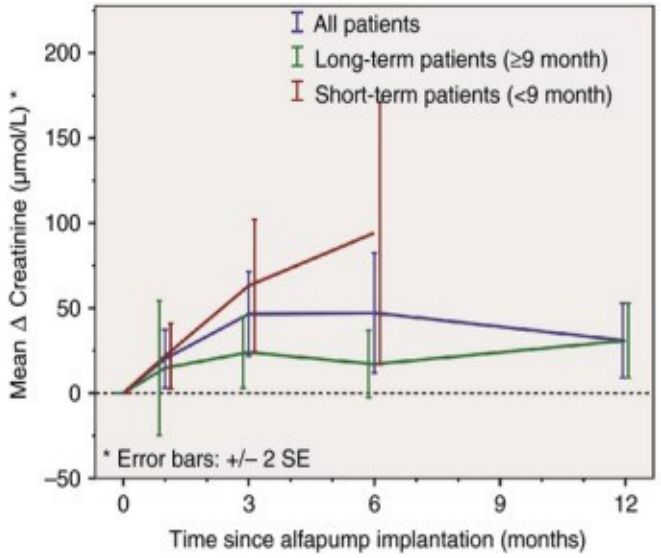
Results: control of ascites, overall survival

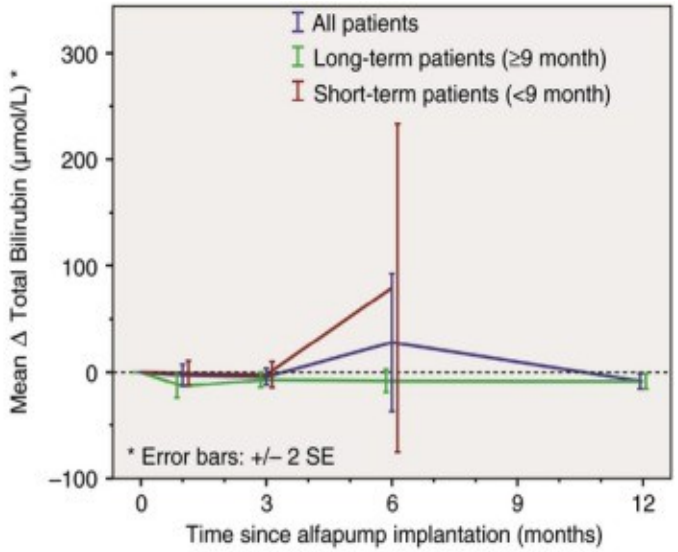


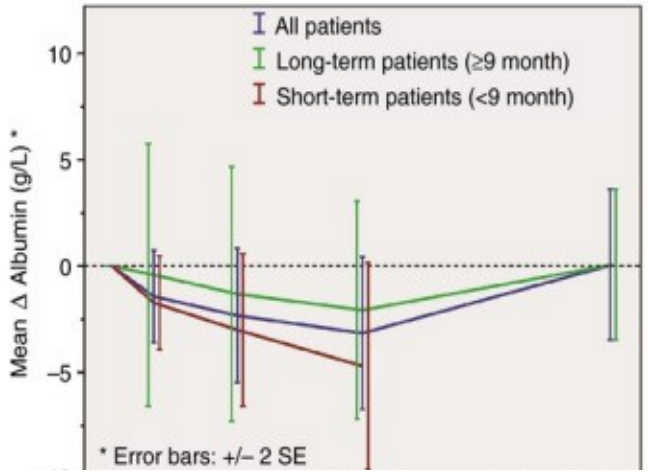


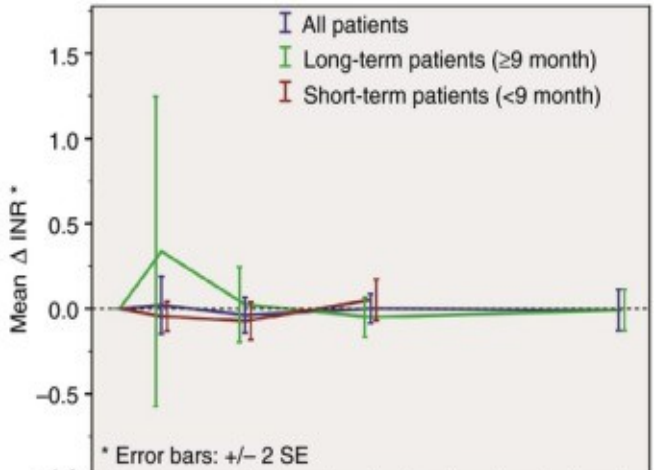
Stirnimann. Aliment Pharmacol Ther. 2017 Nov;46(10):981-991

Biological tests over time



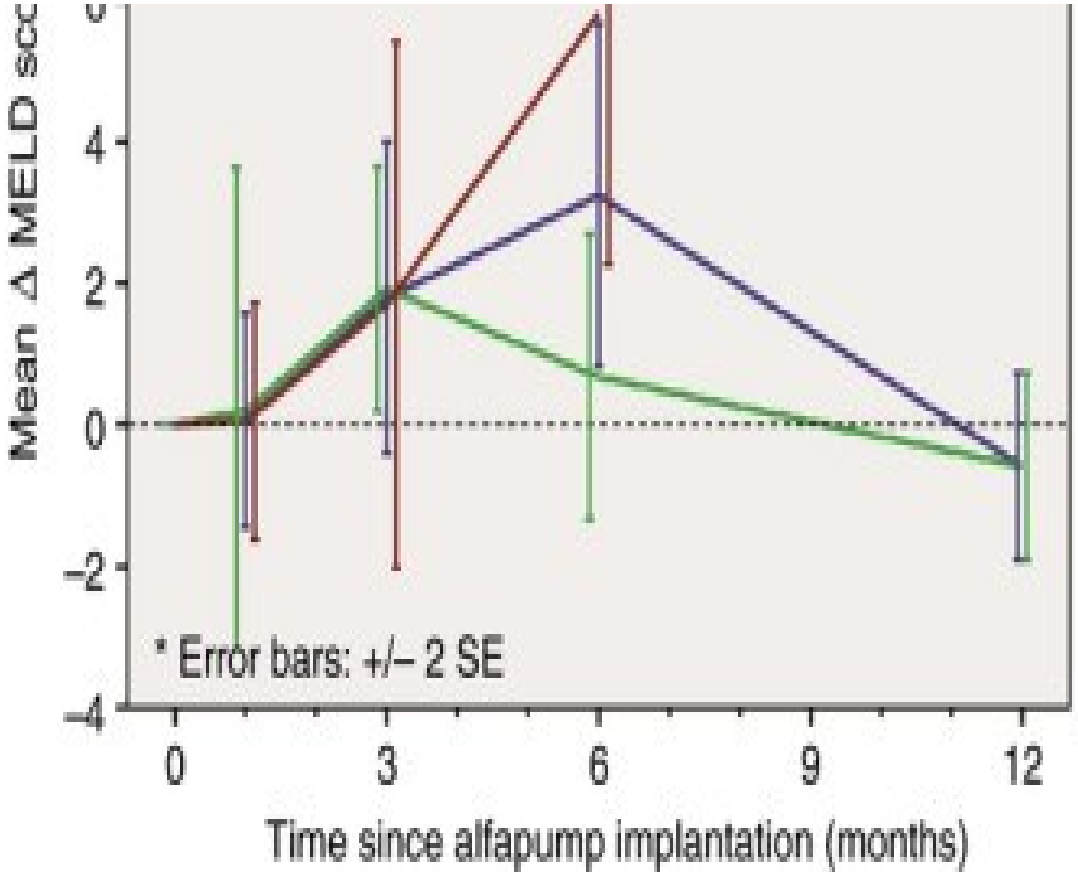


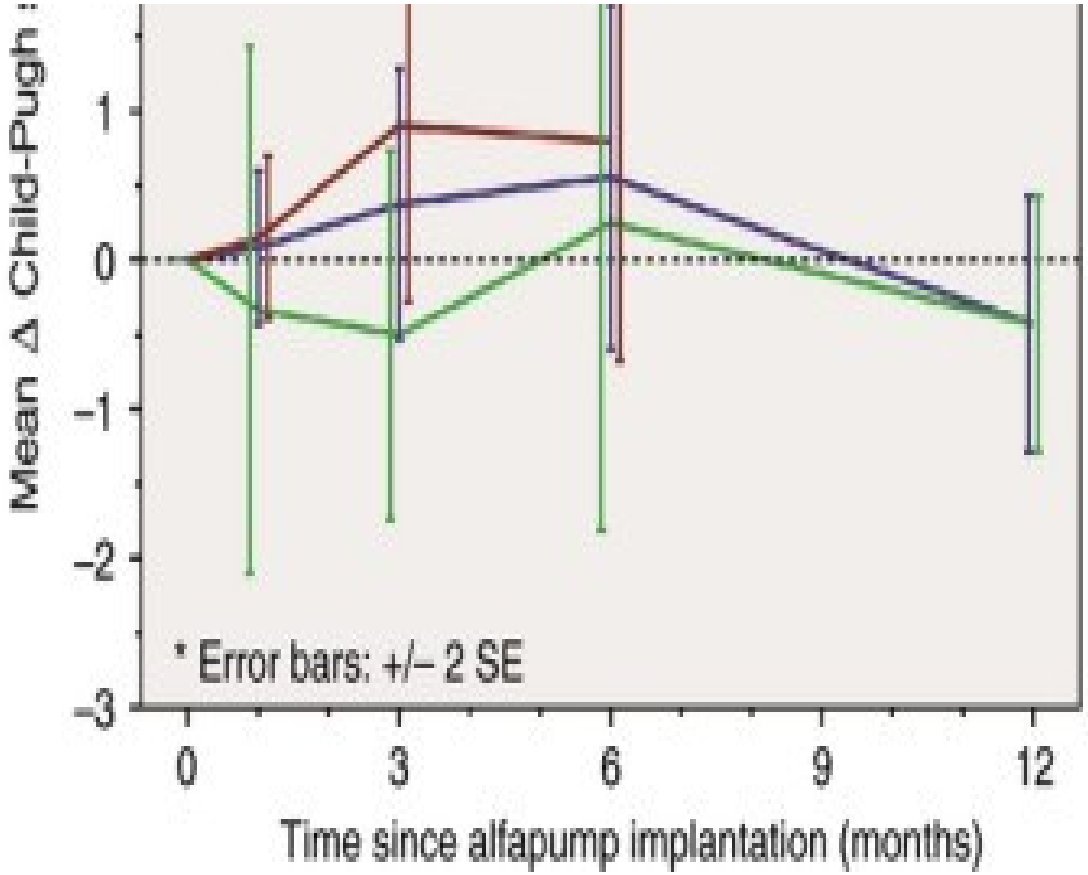




Stirnimann. Aliment Pharmacol Ther. 2017 Nov;46(10):981-991

Liver function over time

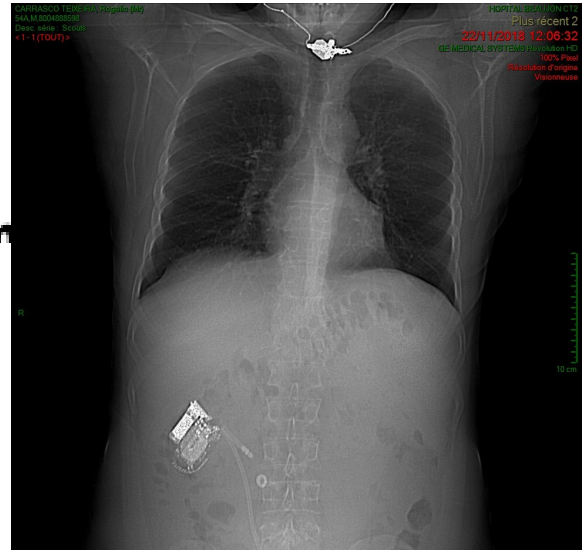


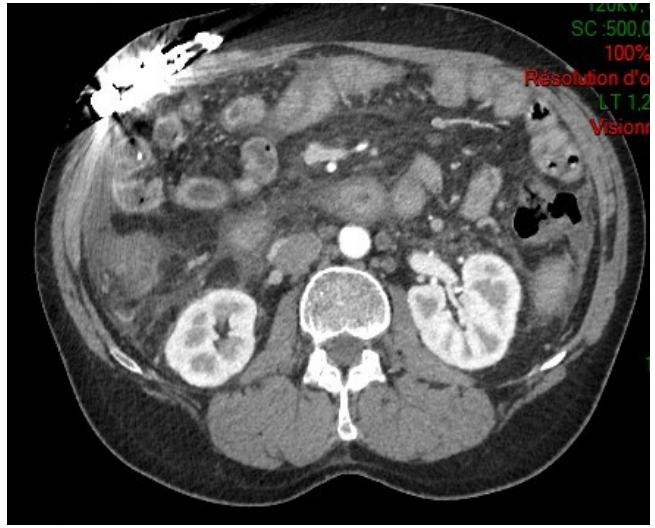


Stirnimann. Aliment Pharmacol Ther. 2017 Nov;46(10):981-991

Mr C

Pump serial no.: **6119**
Days since implant: **160**
Total volume of fluid removed: **149.4 liters**
Average daily volume of the last 7 complete days: **1042.9 m**





- LT on December 2018, pump removed
- No post LT complication

Take Home Messages

- Patients with refractory ascites should be evaluated for liver transplantation
- Alfapump may be proposed on waiting list
  - When TIPS is contra-indicated / ineffective
  - In Child B patients
  - Without urinary tract obstruction
  - In experienced center
- In the future, Alfapump may replace TIPS on waiting list

Refractory ascites: definition

- Ascites that cannot be mobilized or the early recurrence of which cannot be satisfactorily prevented by medical therapy

- 2 differents types
  - Diuretic resistant: lack of response to dietary sodium restriction and intensive diuretic treatment

  - Diuretic intractable: development of diuretic-induced complications that preclude the use of an effective diuretic dosage

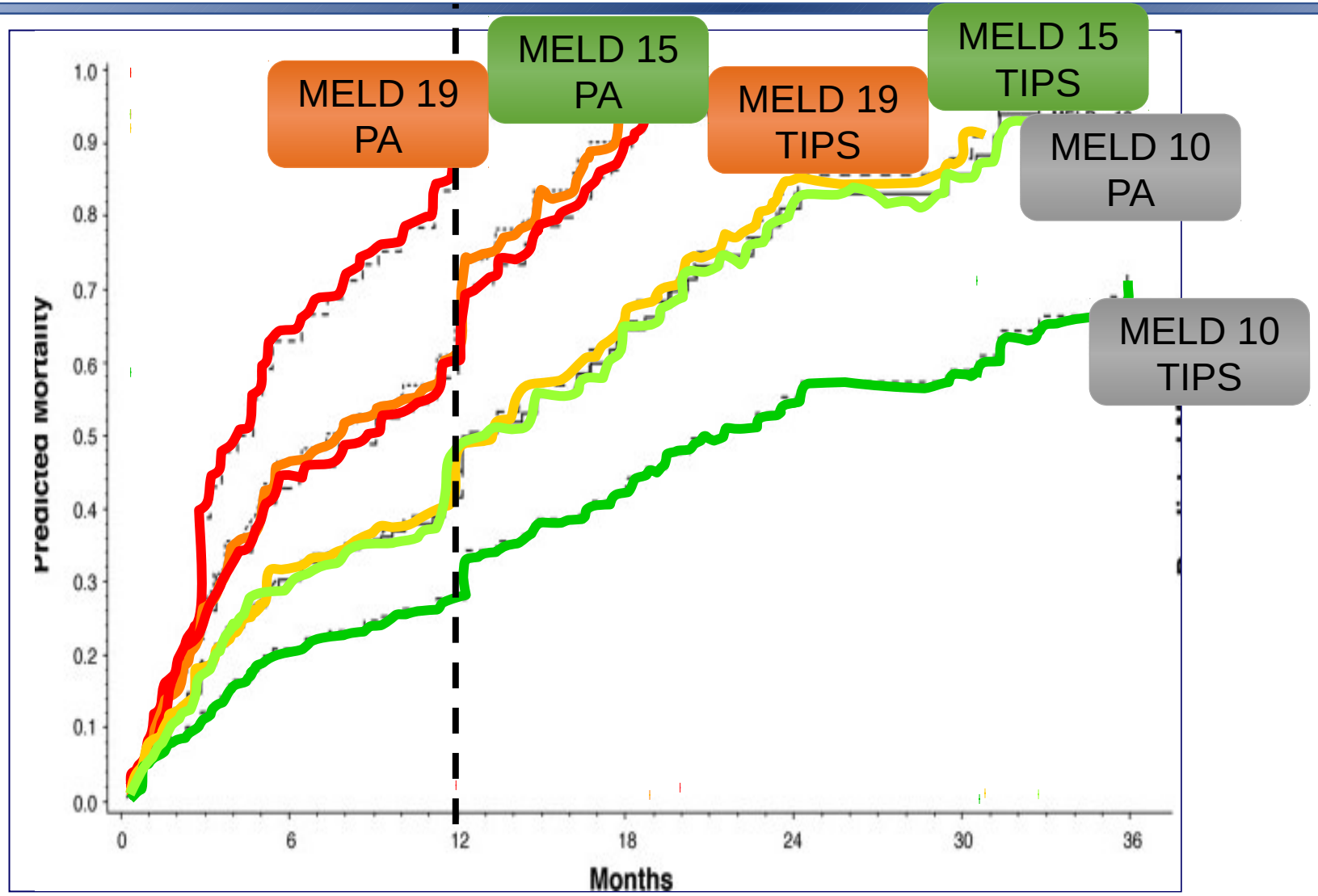
Arroyo et al. Hepatology 1996.23:164-76.

Refractory ascites: complications

- **Acute complications:**
  - umbilical rupture
  - strangulated hernia
  - infection

- **Chronic manifestations:**
  - muscle wasting
  - pleural effusion
  - hyponatremia
  - renal dysfunction

Refractory ascites: mortality



Salerno, Gastroenterology 2007: 133:825-34